<110> Nakaita, Yasukazu
       Tsuchiya, Youichi

<120> A method for detecting and determining lactic acid bacterium

<130> 294857US0PCT

<140> 10/589389
<141> 2006-08-15

<150> PCT/JP05/02331
<151> 2005-02-16

<150> JP 2004-040381
<151> 2004-02-17

<160> 30

<170> PatentIn version 3.3

<210> 1
<211> 1565
<212> DNA
<213> Lactobacillus hexosus

<220>
<221> source
<222> (1)..(1565)
<223> strain="SBC8050"

<400> 1
ttggagagtt tgatcctggc tcaggacgaa cgctggcggc gtgcctaata catgcaagtc

60

gaacgcacag atattaacag aagctgcttg cagtggaagy taattgatgt gagtggcgga

120

cgggtgagta acacgtgggt aacctaccca aaagtggggg ataacatttg gaaacagatg

180

ctaataccgc ataatttaag tgaccacatg gtcacttaat gaaagatggy ttcggctatc

240

acttttggat ggacccgcgg cgtattagct agttggtggg ataacggcct accaaggcga

300

tgatacgtag ccgacctgag agggtaatcg ccacattgg gactgagaca cggcccaaac

360

tcctacggga ggcagcagta gggaatcttc cacaatggac gaaagtctga tggagcaacg

420

ccgcgtgagt gaagaaggtt ttcggatcgt aaaactctgt tgttggagaa gaacagggac

480

tagagtaact gttagtccta tgacggtatc caaccagaaa gccacggcta actacgtgcc

540

agcagccgcg gtaatacgta ggtggcaagc gttgtccgga tttattgggc gtaaagcgag

600

cgcaggcggt tttttaagtc tgatgtgaaa gccttcggct taaccgaaga agtgcattag

660

aaactgggaa acttgagtgc agaagaggag agtggaactc catgtgtagc ggtgaaatgc

720

gtagatatat ggaagaacac cagtggcgaa ggcggctctc tggtctgtaa ctgacgctga

780

ggctcgaaag tatggggagc aacaggatt agataccctg gtagtccata ccgtaaacga

840

tgaatgctaa gtgttggagg gtttccgccc ttcagtgctg cagctaacgc attaagcatt

900

ccgcctgggg agtacgaccg caaggttgaa actcaaagga attgacgggg gcccgcacaa

960

gcggtggagc atgtggttta attcgaagct acgcgaagaa ccttaccagg tcttgacatc

1020

ctttgaccac tgtagagata cagctttccc ttcggggaca aagtgacagg tggtgcatgg

1080

ttgtcgtcag ctcgtgtcgt gagatgttgg gttaagtccc gcaacgagcg caacccttat

1140

gactagttgc cagcattaag ttgggcactc tagtgagact gccggtgaca aaccggagga

1200

aggtggggat gacgtcaaat cagcatgccc cttatgacct gggctacaca cgtgctacaa

1260

tggttggtac aacgagttgc gaacccgcga gggtaagcta atctcttaaa gccaatctca

1320

gttcggattg taggctgcaa ctcgcctaca tgaagtcgga atcgctagta atcgcggatc

1380

agcacgccgc ggtgaatacg ttcccgggcc ttgtacacac cgcccgtcac accatgagag

1440

tttgtaacac ccgaagccgg tggggtaacc tctatgagga gctaaccgtc taaggtggga

1500

cagatgattg gggtgaagtc gtaacaaggt agccgtagga gaacctgcgg ctggatcacc

1560

tcctt

1565

<210> 2
<211> 517
<212> DNA
<213> Lactobacillus hexosus

<220>
<221> source
<222> (1)..(517)
<223> strain="SBC8050"

<400> 2
cagttctgtg tttacatggt gttggtgctt cagtcgttaa cgctttgtct agccaattaa

60

acgttgaggt ccttaaagaa ggaaaacgct actatatgga tttcaagcgc ggtaaagtta

120

atactgagct taaggttagc ggtacaattc cagaacatga acacggcaca attgttcatt

180

tttggcctga tcatgatatt tttagggaaa caaccgttta tgatattaaa attttaacaa

240

cgcgaattcg tgagttggcc tttttgaata agggtttacg aattagcatt gaagatttac

300

gtcctgagaa accgaccaaa gaagttttcc actatgaagg tggcattaag agttacgttg

360

agtatttaga caacggtaag cacgatcttt ttccagagcc aatttacgtg gaaggtgacg

420

aaaagggaat taaggttgaa gttgctttac aatacactga cgattaccac actaacttga

480

tgaccttcgc caataatatt catacctatg aagtgga

517

<210> 3
<211> 1526
<212> DNA
<213> Lactobacillus pseudocollinoides

<220>
<221> source
<222> (1)..(1526)
<223> strain="SBC8057"

<400> 3
tgatcctggc tcaggatgaa cgctggcggc gtgcctaata catgcaagtc gaacgcatcc   60

cgttaaatga agtgcttgca cggattttaa catcggatga gtggcgaact ggtgagtaac   120

acgtgggtaa cctgcccaga agcaggggat aacacttgga aacaggtgct aataccgtat   180

aacaacaaaa accgcatggt ttttgtttga aaggtggttt cggctatcac ttctggaagg   240

acccgcggcg tattagctag ttggtggagt aacggttcac caaggcaatg atacgtagcc   300

gacctgagag ggtaatcggc cacattggga ctgagacacg gcccaaactc ctacgggagg   360

cagcagtagg gaatcttcca caatggacga aagtctgatg gagcaacgcc gcgtgagtga   420

agaaggtttt cggatcgtaa aactctgttg ttgaagaaga acacgtttga gagtaactgt   480

tcagacgttg acggtattca accagaaagc cacggctaac tacgtgccag cagccgcggt   540

aatacgtagg tggcaagcgt tatccggatt tattgggcgt aaagcgagcg caggcggtta   600

cttaagtctg atgtgaaagc cttcggctta accggagaag tgcatcggaa actgggtaac   660

ttgagtgcag aagaggacag tggaactcca tgtgtagcgg tgaaatgcgt agatatatgg   720

aagaacacca gtggcgaagg cggctgtctg gtctgtaact gacgctgagg ctcgaaagca

780

tgggtagcga acaggattag ataccctggt agtccatgcc gtaaacgatg aatgctaggt

840

gttggagggt ttccgccctt cagtgccgca gctaacgcat taagcattcc gcctggggag

900

tacgaccgca aggttgaaac tcaaaggaat tgacgggggc ccgcacaagc ggtggagcat

960

gtggtttaat tcgaagctac gcgaagaacc ttaccaggtc ttgacatact gtgctaacct

1020

aagagattag gcgttccctt cggggacgca gatacaggtg gtgcatggct gtcgtcagct

1080

cgtgtcgtga gatgttgggt taagtcccgc aacgagcgca acccttattg tcagttgcca

1140

gcatttagtt gggcactctg gcgagactgc cggtgacaaa ccggaggaag gtggggatga

1200

cgtcaagtca tcatgcccct tatgacctgg gctacacacg tgctacaatg gatggtacaa

1260

cgagttgcga actcgcgaga gcaagctaat ctcttaaagc cattctcagt tcggactgta

1320

ggctgcaact cgcctacacg aagtcggaat cgctagtaat cgcggatcag catgccgcgg

1380

tgaatacgtt cccgggcctt gtacacaccg cccgtcacac catgagagtt tgcaacaccc

1440

aaagtcggtt cggtaacctt cgggagccag ccgcctaagg tggggcagat gattagggtg

1500

aagtcgtaac aaggtagccg taggag

1526

<210>   4
<211>   484
<212>   DNA
<213>   Lactobacillus pseudocollinoides

Page 5

<220>
<221>   source
<222>   (1)..(484)
<223>   strain="SBC8057"

<400>   4
ctggtggtct gcatggtgtg gggcatccgt gtgaacgcgc tgtctccgaa ctggacgtta

60

aggtcgttcg ggacggcaag cggtactaca tggactttgc gtacggccac gttaagaccc

120

caatgaaggt cattgacgaa gggttaccag aaaacattcg cgggaccacg gtgcacttct

180

tgccggaccc agatattttc cgggaaacca ctacgtacga cattaagatc ctgaccaccc

240

ggatccgcga gctggctttc ttaaacaagg gtctgcgcat tactatccgt gatgagcggc

300

ctgacgagcc aactgaacaa tcctttatgt acgaaggcgg gatccgtcat tacgttgaat

360

atttaaataa aaacaaggat gtcattttcc ctgaaccaat ctatgttgaa ggtgaagaaa

420

agggcatcac ggttgaagtt gcgttgcagt ataccgacga ctaccactca aacctgttga

480

cgtt

484

<210>   5
<211>   330
<212>   DNA
<213>   Pediococcus damnosus

<220>
<221>   source
<222>   (1)..(330)
<223>   strain="SBC8023"

<220>
<221>   misc_feature
<222>   (19)..(19)
<223>   n strands for any base

<400>   5
ttattgtgcc tgtcaaatnc aagttcttga aggtttggaa gcagttagaa aacgtcccgg

60

aatgtatatt ggggcaacaa gtgcccaagg actccatcat ttagtttggg aaattattga

120

taacggaatt gatgaagctt tagccgggtt tgcggataaa atcgatgtga cggttgaaaa

180

agataatagc attacggttt ttgataatgg ccgaggaatt ccagttggaa tccaggctaa

240

gactggtaaa ccagccctag agacagtttt cacaattttg catgccggtg gtaagtttgg

300

cggcggcggt tataaagttt caggtgggta

330


```
<210>   6
<211>   21
<212>   DNA
<213>   Artificial

<220>
<223>   a primer for L. hexosus

<400>   6
```
gcggtaaagt taatactgag c

21


```
<210>   7
<211>   20
<212>   DNA
<213>   Artificial

<220>
<223>   a primer for L. hexosus or L. pseudocollinoides

<400>   7
```
atkccctttt cktcaccttc

20


```
<210>   8
<211>   18
<212>   DNA
<213>   Artificial

<220>
<223>   a primer for L. pseudocollinoides

<400>   8
```
gttcgggacg gcaagcgg

18

<210> 9
<211> 17
<212> DNA
<213> Artificial

<220>
<223> a primer for P. damnosus

<400> 9
aagttcttga aggtttg

17

<210> 10
<211> 16
<212> DNA
<213> Artificial

<220>
<223> a primer for P. damnosus

<400> 10
tcggccatta tcaaaa

16

<210> 11
<211> 21
<212> DNA
<213> Artificial

<220>
<223> a primer

<400> 11
tggttaaata ccgtcaaccc t

21

<210> 12
<211> 20
<212> DNA
<213> Artificial

<220>
<223> a primer

<400> 12
ggataccgtc actgcatgag

20

<210> 13
<211> 18
<212> DNA
<213> Artificial

<220>

<223> a primer

<400> 13
ttgaataccg tcaacgtc

18

<210> 14
<211> 20
<212> DNA
<213> Artificial

<220>
<223> a primer

<400> 14
ccatgtggtc acttaaattc

20

<210> 15
<211> 19
<212> DNA
<213> Artificial

<220>
<223> a probe

<220>
<221> modified_base
<222> (1)..(1)
<223> LC Red640 labelled

<220>
<221> modified_base
<222> (19)..(19)
<223> phosphorylated

<400> 15
cgccactcgc ttcattgtt

19

<210> 16
<211> 20
<212> DNA
<213> Artificial

<220>
<223> a probe

<220>
<221> modified_base
<222> (1)..(1)
<223> LC Red640 labelled

<220>
<221> modified_base

<222> (20)..(20)
<223> phosphorylated

<400> 16
cgccacccac atcaattaac

20

<210> 17
<211> 20
<212> DNA
<213> Artificial

<220>
<223> a probe

<220>
<221> modified_base
<222> (1)..(1)
<223> LC Red705 labelled

<220>
<221> modified_base
<222> (20)..(20)
<223> phosphorylated

<400> 17
cgccactcac tttatagttg

20

<210> 18
<211> 18
<212> DNA
<213> Artificial

<220>
<223> a probe

<220>
<221> modified_base
<222> (1)..(1)
<223> LC Red705 labelled

<220>
<221> modified_base
<222> (18)..(18)
<223> phosphorylated

<400> 18
cgccactcat ccgatgtt

18

<210> 19
<211> 22
<212> DNA
<213> Artificial

```
<220>
<223>  a probe


<220>
<221>  modified_base
<222>  (22)..(22)
<223>  FITC labeled

<400>  19
ggttacccac gtgttactca cc

22


<210>  20
<211>  23
<212>  DNA
<213>  Artificial

<220>
<223>  a probe


<220>
<221>  modified_base
<222>  (23)..(23)
<223>  FITC labelled

<400>  20
gtggaaggtg aagaaaaggg aat

23


<210>  21
<211>  24
<212>  DNA
<213>  Artificial

<220>
<223>  a probe


<220>
<221>  modified_base
<222>  (1)..(1)
<223>  LC Red705 labelled

<220>
<221>  modified_base
<222>  (24)..(24)
<223>  phosphorylated

<400>  21
ggttgaagtt gctttacagt acac

24


<210>  22
<211>  21
```

<212> DNA
<213> Artificial

<220>
<223> a probe

<220>
<221> modified_base
<222> (21)..(21)
<223> FITC labelled

<400> 22
cttgtggtag accctcttca a

21

<210> 23
<211> 18
<212> DNA
<213> Artificial

<220>
<223> a probe

<220>
<221> modified_base
<222> (1)..(1)
<223> LC Red640 labelled

<220>
<221> modified_base
<222> (18)..(18)
<223> phosphorylated

<400> 23
gtgcattggc gtcttcac

18

<210> 24
<211> 19
<212> DNA
<213> Artificial

<220>
<223> a primer

<400> 24
cgagcttccg ttgaatgac

19

<210> 25
<211> 21
<212> DNA
<213> Artificial

<220>

<223> a primer

<400> 25
ggtcattcgt ggcgggaaaa a

21

<210> 26
<211> 21
<212> DNA
<213> Artificial

<220>
<223> a primer (GYPF)

<400> 26
ggwtayaarg twtcwggtgg t

21

<210> 27
<211> 18
<212> DNA
<213> Artificial

<220>
<223> a primer (GYPR)

<400> 27
tcatgygtwc accttcat

18

<210> 28
<211> 23
<212> DNA
<213> Artificial

<220>
<223> a primer (GP1-F)

<220>
<221> misc_feature
<222> (7)..(7)
<223> n strands for any base

<220>
<221> misc_feature
<222> (11)..(11)
<223> n strands for any base

<220>
<221> misc_feature
<222> (12)..(12)
<223> n strands for any base

<220>
<221> misc_feature
<222> (14)..(14)

<223> n strands for any base
<220>
<221> misc_feature
<222> (20)..(20)
<223> n strands for any base

<400> 28
attatgntgc nngncaaatn caa

23

<210> 29
<211> 21
<212> DNA
<213> Artificial

<220>
<223> a primer (GP1-R)

<400> 29
accaccwgaw acyttrtawc c

21

<210> 30
<211> 21
<212> DNA
<213> Artificial

<220>
<223> a universal primer 16S rRNA gene

<400> 30
tggagagttt gatcctggct c

21